

Serial No. 10/517,302
Amendment
Responsive to Office Action dated July 10, 2007

Docket No. SAK-37

REMARKS

Pending Claims

Claims 2-4 are pending in this application. Claims 2, 3, 4 has been amended. Claims 6 and 7 have been canceled without prejudice or disclaimer. No new matter has been added.

Drawings

Reconsideration and withdrawal of the objections to the drawings is respectfully requested in view of the fact that the claims have been substantially amended and the features are shown in the drawings, particularly Figs. 2, 3 and 12.

Claim Rejections under 35 U.S.C. §112

Claim 2 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 2, 3 and 4 have been amended in a manner which it is submitted satisfies all the requirements of 35 U.S.C. §112.

Claim Rejections under 35 U.S.C. §102

Claims 2-4 and 6-7 are rejected under 35 U.S.C. §102(b) as being anticipated by Bell et al, U.S. Patent No. 5,882,226.

For the reasons set forth hereafter, it is submitted that claims 2, 3 and 4, as amended, are patentable.

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Patentability of the Claims

Applicant's invention is directed to a coaxial cable with a plug wherein the plug has a contact portion which is pivotable with respect to a main body portion between a straight position wherein the contact portion extends straight out from the main body portion and a right angle or orthogonal position wherein the contact portion is at a right angle to the main body portion.

Claim 2 has been amended to further clarify the invention. In claim 2 the limitation of "on a rotation axis perpendicular to the axial direction of said center contact" is supported by the description with reference to Figs. 2, 3, and 12 in the Specification.

Moreover, the limitation of "the coaxial structure about the connection between said center contact and said central conductor connecting member is maintained before, after and during the rotation" is supported by the description with reference to Figs. 2 and 12 in the Specification of the present application.

Claim 3 has been amended to clarify the features of the external contact and the central contact in the coaxial cable with a plug according to the invention in the present application. Thus, the limitation of "has in an outer peripheral surface of the tubular conductor", "an opening via which communication is provided between the outside and the inside of said tubular conductor at a position through which the rotation axis extends" is supported by the description with reference to Figs. 2 and 4(a) and 4(b) in the Specification of the present application. Moreover, the limitation of "supported so that the bent portion coincides with the

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rotation axis" is supported by the description with reference to Figs. 2, 5 and 6 in the Specification of the present application.

Claim 4 has been amended to clarify the feature of the external conductor connecting member in the coaxial cable with a plug according to the invention in the present application. The limitation of "when the two or more conductor parts are combined, a pair of supporting and fixing portions to be engaged with a pair of projections of said external contact are formed" is supported by the description with reference to Fig. 9 in the Specification of the present application.

The coaxial cable with a plug according to the present invention has the following major features set forth in the claims:

(a) that the plug attached to the end of the coaxial cable is formed of a contact portion and a main body portion, and the contact portion rotates on a rotation axis in a direction perpendicular to the coaxial direction (the axial direction of the central contact) thereof, and

(b) that when the contact portion is rotated, the coaxial structure about the connection between the central contact and the central conductor connecting member is maintained before, after and during the rotation.

The coaxial cable with a plug according to the present invention has the above-described features (a) and (b) which provide the advantages of, for example, increasing the degree of freedom of adaptation to use and a place where it is used, and being capable of preventing a change in transmission impedance in the plug. In particular, the advantage of

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being capable of preventing a change in transmission impedance is an advantage specific to the coaxial cable with a plug according to the present invention.

The present invention as now claimed is patentable over the cited U.S. Patent No. 5,882,226 to Bell. In the plug described in Bell, the rotation between "plug body 12" and "pins 20" and "over-moulding 74" is rotation on a rotation axis corresponding to the axial direction of "pins 20", which is different from the feature (a) of the coaxial cable with a plug according to the present invention.

Also, the plug in Bell is capable of changing the "cable 60" lead-out direction by rotation between connecting portions of the "plug body 12" and "pins 20" and "over-moulding 74". However, the angle between "pins 20" and "cable 60" is constant at all times. That is, while the coaxial cable with a plug according to the present invention can be selectively used in a straight-type state and a right-angle-type state according to a place of use, the plug described in Bell cannot be used in this manner.

In the case where the connecting portions of the "plug body 12" and "pins 20" and "over-moulding 74" on the rotation axis corresponding to the axial direction of "pins 20" as in the plug described in Bell, the coaxial structure about the connecting portions of "pins 20" and "conductor 68", i.e., the coaxial structure of the rotating portions, can be maintained comparatively easily before and after rotation thereof or during the rotation.

In contrast, in a case where the rotation axis is set in correspondence with a direction perpendicular to the axial direction of the center contact (corresponding to the pins 20 in Bell)

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as in the coaxial cable with a plug according to the present invention, it is difficult to maintain the coaxial structure of the rotating portions.

The "coaxial structure" here refers to a coaxial structure in high-frequency devices and generally means that a central conductor and an outer conductor provided so as to surround the central conductor are mechanically in a constant positional relationship at all times.

For example, in the case of a coaxial cable, an insulating member in annular (tubular) form having a certain thickness is interposed between a central conductor and an outer conductor, as viewed in a cross section perpendicular to the axis of the coaxial cable.

An ideal material for the insulating member interposed between the central conductor and the outer conductor is air. Air has a low dielectric constant and is capable of maintaining a constant characteristic impedance through a frequency range up to a high frequency when used as the insulating member.

However, if the insulating material interposed between the central conductor and the outer conductor in the coaxial cable is air, for example, the central conductor and the outer conductor are brought into contact with each other when the coaxial cable is bent. In such situation, not only failure to maintain the coaxial structure but also failure to function as a coaxial cable results.

Therefore, in a high-frequency device, such as a coaxial cable, which may be used in a bent state, for example an insulating material such as polyethylene having a low dielectric constant is interposed between the central conductor and the outer conductor to maintain the

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positional relationship between the central conductor and the outer conductor, i.e., "coaxial structure", even when the device is bent.

When the connecting portions (e.g., in Fig. 2) in the contact portion and the main body portions of the coaxial cable with a plug according to the present invention are viewed on the basis of the above-described interpretation of the "coaxial structure", the connection between the center contact and the central conductor connecting member is located on the rotation axis and inside the external contact. Therefore, when the contact portion is rotated, the positional relationship (distance) between the external contact and the connection between the center contact and the central conductor connecting member is not changed before, after and during the rotation.

Further, in the coaxial cable with a plug according to the present invention, the outer conductor connecting member is formed of two conductor members, and a pair of opening portions (supporting portions) to be engaged with the projections of the external contact are formed when the two conductor members are combined. There is, therefore, no possibility of breakage in the outer conductor (breakage in the coaxial structure) at the connecting portion between the external contact and the outer conductor connecting member. Accordingly, substantially no change in transmission impedance in the plug portion is observed in the coaxial cable with a plug according to the invention in the present application.

Thus, the coaxial cable with a plug according to the present invention is markedly different in construction and effect from the device described in Bell and is not taught by Bell. Claims 2, 3 and 4 are therefore patentable.

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Conclusion

In view of the foregoing, Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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